UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. L8159

CITY NO. 34

OVER THE

MISSISSIPPI RIVER OVERFLOW

DISTRICT 9 - WASHINGTON COUNTY, CITY OF COTTAGE GROVE

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 125)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. L8159, the East Abutment and Piers 1 and 2, were found to be in good to satisfactory condition with no defects of structural significance. The footing at Pier 1 was partially exposed at the upstream and downstream ends, and several areas of section loss and minor scaling were observed at Piers 1 and 2. The channel bottom around the substructure units appeared stable with no significant scour and with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) Three evenly spaced vertical hairline cracks were located near the center of the East Abutment extending from the top of the abutment to 1 foot above the waterline.

(B) The footing at Pier 1 was partially exposed at the upstream and downstream ends with a maximum vertical face exposure of 3 feet at the upstream end and 2 feet at the downstream end.

(C) Several areas of section loss were observed below the waterline at the upstream and downstream ends of Pier 2 with a maximum penetration of 2 inches.

(D) An area of section loss, 8 inches in diameter, was observed at the waterline on the center of Pier 1 with a penetration of 1.5 inches.

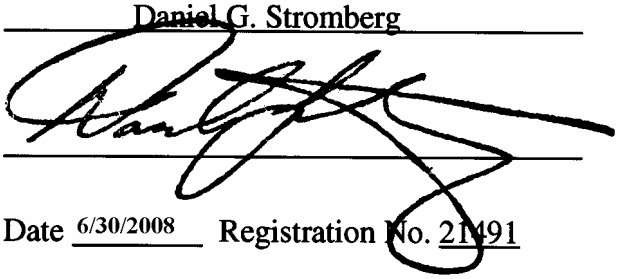
RECOMMENDATIONS:

(A) No plans for the structure were available at the time of the inspection. It is recommended that existing plans be reviewed to determine the foundation type and depth at Pier 1 in regard to the footing exposure. It is also recommended that the scour analysis be reviewed to determine if the exposed footing was considered and/or expected in the coding of Item 113. Based on the findings from the plans and scour analysis, countermeasures may be warranted, such as placing riprap around the exposed footing at Pier 1 to prevent further exposure.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

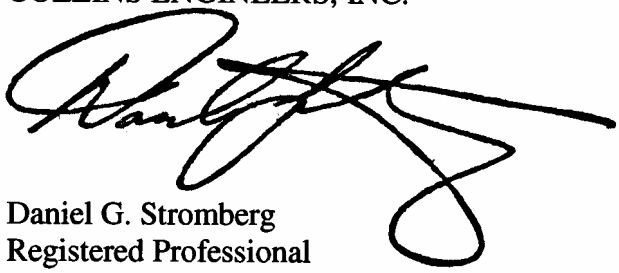
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: L8159

Feature Crossed: The Mississippi River Overflow

Feature Carried: City No. 34

Location: District 9 - Washington County, City of Cottage Grove

Bridge Description: The bridge superstructure consists of three spans which support a reinforced concrete deck. The two approach spans consist of multiple steel girders and the center span is a Warren Truss. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are numbered 1 and 2 starting at the west end of the bridge. No design drawings with foundation details were available.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 18, 2007

Weather Conditions: Cloudy/Rain, 60ºF

Underwater Visibility: 1.0 foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East Abutment, Piers 1 and 2.

General Shape: The piers each consist of two square reinforced concrete columns connected by a concrete diaphragm. The columns are supported on rectangular concrete footings. The abutments consist of vertical reinforced concrete walls with skewed wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of Pier 1 on the east end.

Water Surface: The waterline was approximately 4.5 feet below reference.
Assumed Waterline Elevation = 95.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code I/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

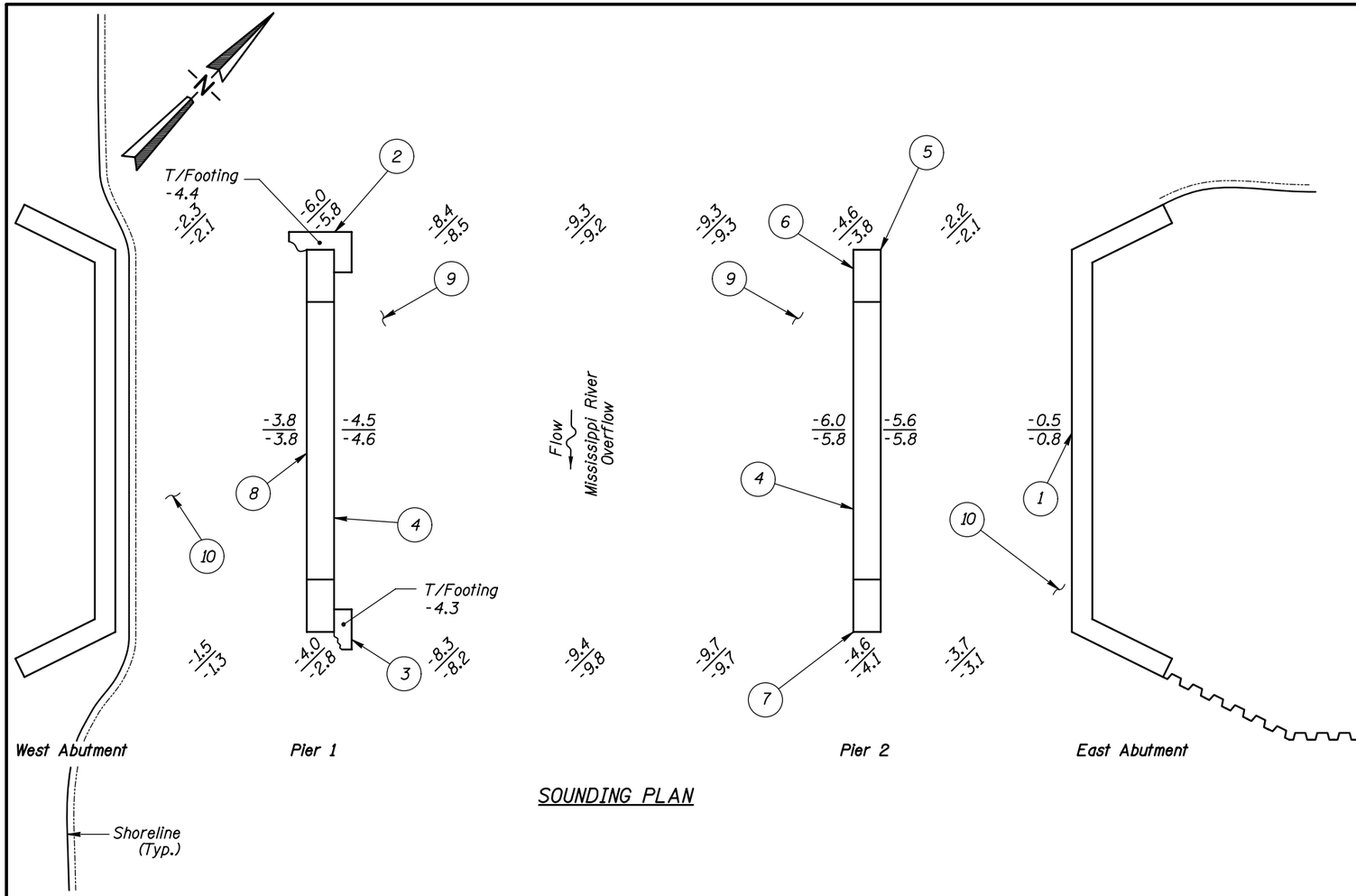
_____ Yes X No

Photograph 1. View of West Abutment, Looking West.

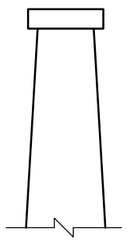
Photograph 2. View of Pier 1, Looking Northwest.

Photograph 3. View of Pier 2, Looking Northwest.

Photograph 4. View of East Abutment, Looking Northeast.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. The East Abutment and Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 18, 2007, the waterline was located approximately 4.5 feet below the top of the pier cap on the downstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 95.5.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at the mid points between the abutments and piers and at 1/4 point intervals between the the piers.

INSPECTION NOTES:

(1) Three evenly spaced vertical hairline cracks were observed at the center of the East Abutment from the top of the abutment to 1 foot above the waterline.

(2) The footing at the upstream end of Pier 1 was exposed with up to 3 feet of vertical face exposure at the North corner.

(3) The footing at the downstream end of Pier 1 was exposed with up to 2 feet of vertical exposure.

(4) A 6-inch-wide band of minor scaling was observed at the waterline at Piers 1 and 2.

(5) An area of section loss, 3 inches in diameter, was observed 6 inches above the channel bottom on the upstream end of Pier 2 with up to 1 inch of penetrtion.

(6) Two areas of section loss, 6 inches in height and 12 inches wide, were observed 4 feet below the waterline with up to 1 inch of penetration.

(7) An area of section loss, 6 inches in diameter, was observed on the corner at the channel bottom with up to 2 inches of penetration.

(8) An area of section loss, 8 inches in diameter, was observed at the waterline with 1.5 inches of penetration.

(9) The channel bottom consisted of sand, riprap, and broken concrete with no appreciable probe rod penetration.

(10) The channel bottom consisted of firm sandy gravel with a maximum probe rod penetration of 1 inch.

Legend

-2.0 / -5.2 — Sounding Depth (10/18/07) / Sounding Depth (9/30/02)

Bank Erosion

Steel Sheet Piling Wall

Note:

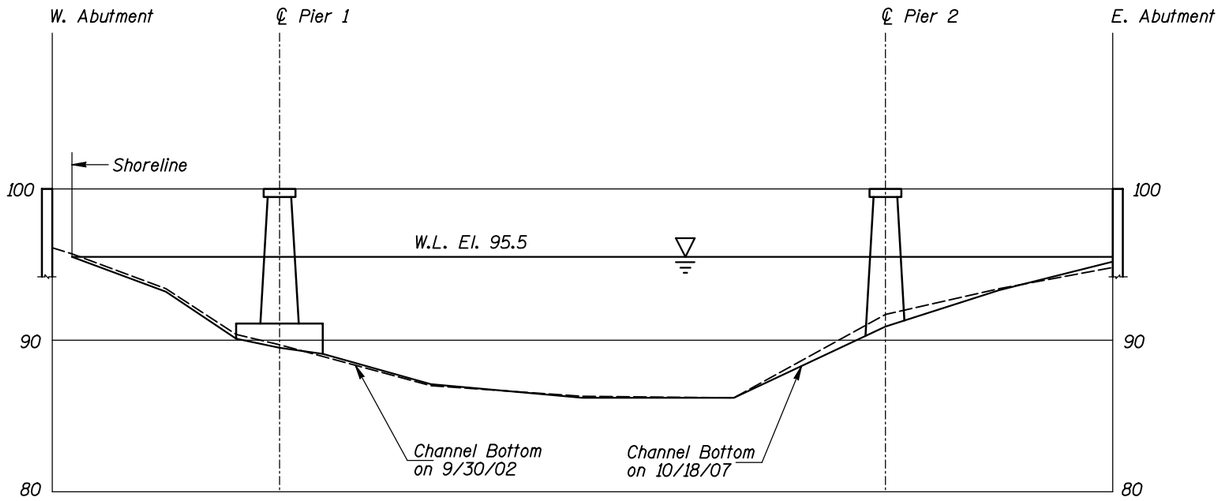
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

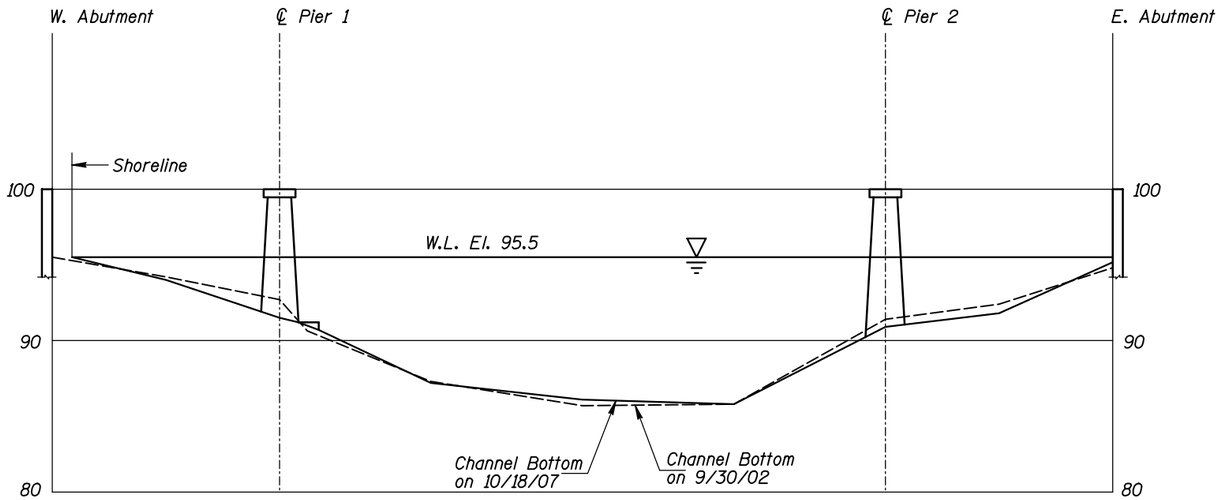
STRUCTURE NO. L8159
OVER THE MISSISSIPPI RIVER OVERFLOW
DISTRICT 9, WASHINGTON COUNTY, CITY OF COTTAGE GROVE

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT., 2007
Checked By: MDK		Scale: NTS
Code: 52210125		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:

Refer to Figure 1 for General Notes.

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STRUCTURE NO. L8159
OVER THE MISSISSIPPI RIVER OVERFLOW
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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT., 2007
Checked By: MDK		Scale: NTS (U.O.N.)
Code: 52210125		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 18, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: L8159 WEATHER: Cloudy/Rainy, 60ºF

WATERWAY CROSSED: The Mississippi River Overflow

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER_____

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera

TIME IN WATER: 8:30 A.M.

TIME OUT OF WATER: 9:00 A.M.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY 1 foot

DEPTH 6 feet maximum at Piers 1 and 2

ELEMENTS INSPECTED: East Abutment and Piers 1 and 2

REMARKS: Overall, the abutments and piers were found to be in good to satisfactory condition with no defects of structural significance. The footing was partially exposed at the upstream and downstream ends of Pier 1 with up to 3 feet of vertical face exposed. Minor scaling and several areas of section loss were observed on Piers 1 and 2, and some hairline cracks were present at the East Abutment. The channel bottom appeared stable with no appreciable changes observed since the previous inspection.

FURTHER ACTION NEEDED: X YES _____ NO

No plans for the structure were available at the time of the inspection. It is recommended that existing plans be reviewed to determine the foundation type and depth at Pier 1 in regard to the footing exposure. It is also recommended that the scour analysis be reviewed to determine if the exposed footing was considered and/or expected in the coding of Item 113. Based on the above review, counter measures could be warranted, such as placing riprap around the exposed footing at Pier 1 to prevent further exposure.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. L8159
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Mississippi River Overflow

INSPECTION DATE October 18, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	MASONRY	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	East Abutment	2.3’	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N
	Pier 1	6.0’	N	7	7	9	N	7	6	N	N	N	6	7	N	N	N	N	N
	Pier 2	6.0’	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the abutments and piers were found to be in good to satisfactory condition with no defects of structural significance. The footing was partially exposed at the upstream and downstream ends of Pier 1 with up to 3 feet of vertical face exposed. Minor scaling and several areas of section loss were observed on Piers 1 and 2, and some hairline cracks were present at the East Abutment. The channel bottom appeared stable with no appreciable changes observed since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.